REMARKS

Claims 1, 19 and 37 have been amended. Claims 1-37 are currently pending. In the Final Office Action, the Examiner rejected claim 1 under 35 U.S.C. §102(b) as being anticipated by *Suzuki* (U.S. Patent No. 5,522,934) and *Ishii et al.* (U.S. Patent No. 5,571,336). In addition, the Examiner has rejected independent claims 19 and 37 under 35 U.S.C. §103(a) in view of one or more of the following U.S. patents: *Li et al., Hartig et al., Ishii et al., Ueda et al., Kadomura et al.* and *Moslehi et al.* Entry of this Amendment and reconsideration of the application are respectfully requested based on the following remarks.

REJECTION OF CLAIMS UNDER 35 USC §102(b)

In the Final Office Action, the Examiner rejected claim 1 under 35 U.S.C. §102(b) as being anticipated by *Suzuki* (U.S. Patent No. 5,522,934). In addition, the Examiner has rejected claim 1 under 35 U.S.C. §102(b) as being anticipated by *Ishii et al.*

In rejecting claim 1, the Examiner states that under a broad interpretation of the word "region," *Suzuki* teaches flowing gas into a top central region 36A. (Final Office Action, pages 6-7). In other words, the Examiner asserts that a top region can be a region at the periphery of a substantially cylindrical plasma processing system. The undersigned earnestly believes that this broad interpretation is not reasonable since it should be known to those skilled in the art that the top region of a substantially cylindrical plasma processing system cannot be a region that is on the periphery of the cylindrical plasma processing system.

Nevertheless, solely in order to expedite prosecution, claim 1 has been amended. Claim 1 recites flowing gas into at least two different regions, including at least one top region located at a top surface of the substantially cylindrical plasma processing chamber and a second region being a peripheral region located on a surface surrounding the periphery of the substantially cylindrical plasma processing chamber. It should be noted that for a substantially cylindrical plasma processing chamber, the top and peripheral surfaces are well understood to those skilled in the art. In fact, the undersigned earnestly believes that th distinction between the top and peripheral surfaces of a cylindrical object is a matter of common knowledge. It should also be

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noted that claim 1 also recites that the peripheral region of the plasma processing chamber does not include any points of the top region of the plasma processing chamber. *Suzuki* does not teach flowing gas into a top region of a plasma processing chamber. Instead, *Suzuki* teaches flowing gas into a plurality of holes around the peripheral region of the plasma processing chamber. (Please see process gas injection holes 36A, 36B, and 36C located around the peripheral region of the plasma processing chamber). Thus, it is respectfully submitted that claim 1 is patentable over *Suzuki* for at least this reason alone.

Furthermore, it should be noted that the process gas mass flow controller (28) of *Ishii et al.* flows the source gas (active or process gas) that is used to etch the substrate only from a top portion. Hence, *Ishii et al.* does not teach or suggest the source gas to be flown into at least two regions in the context of the invention. Thus, claim 1 is patentable over *Ishii et al.* for at least this reason alone.

In view of the foregoing, it is respectfully submitted that independent claim 1 is patentable over the cited art. Furthermore, claims that depend on claim 1 are patentable over the cited art for at least the same reasons as discussed above. Moreover, the dependent claims recite additional features that render them patentable for additional reasons. Therefore, it is respectfully requested that the Examiner withdraw the rejections made under 35 USC §102(b).

REJECTION OF CLAIMS UNDER 35 USC §103(a)

In the Final Office Action, the Examiner rejected claims 10, 11 and 19-37 under 35 U.S.C. §103(a) in view of one or more of the following U.S. patents: *Li et al., Hartig et al., Ishii et al., Ueda et al., Kadomura et al.* and *Moslehi et al.*

As conceded by the Examiner, there is no teaching or suggestion in *Ueda et al. or Kadomura et al.* with respect to a gas flow system as recited in independent claims 19 and 37. However, the Examiner asserts that the deficiencies of *Kadomura et al.* and *Ueda et al.*, in this respect, are cured by one or more of the following U.S patents: *Moslehi et al., Li et al., Hartig et al.*, and *Ishii et al.* As noted in the Amendment dated January 26, 2001, none of these references teach or suggest a gas flow system for controlling flow of source gas into at least two regions in the context of the inv ntion.

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Since independent claims 19 and 37 both recite similar elements, it is respectfully submitted that independent claims 19 and 37 are patentable ov r the cited art. Furthermore, claims that depend on claims 19 and 37 are patentable over the cited art for at least the same reasons as discussed above. Moreover, the dependent claims recite additional features that render them patentable for additional reasons. Therefore, it is respectfully requested that the Examiner withdraw the rejections made under 35 USC §103(a).

In view of the foregoing, it is respectfully submitted that claims 1-37 are patentably distinct from the cited references. Reconsideration of the application and a Notice of Allowance are earnestly solicited. If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below. Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. LAM1P123).

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MARKED UP VERSION INDICATING CHANGES MADE

1. (Amended four times) A plasma processing system, said plasma processing system comprising:

a substantially cylindrical plasma processing chamber used to process a substrate, said substantially cylindrical plasma processing chamber including a top region located on the top surface of said substantially cylindrical plasma processing chamber and a peripheral region located on a surface surrounding the periphery of said substantially cylindrical plasma processing;

a gas flow system coupled to said plasma processing chamber, said gas flow system controlling flow of input gas into at least two different regions of said plasma processing chamber; said input gas being a source gas suitable for use to etch said substrate in said plasma processing chamber;

wherein said at least two different regions include at least one peripheral region and at least one top region of said plasma processing chamber; and

wherein said peripheral region of said plasma processing chamber does not include any points of said top region of said plasma processing chamber.

19. (Thrice Amended) A plasma processing system for processing a substrate, comprising:

a substantially cylindrical plasma processing chamber within which a plasma is both ignited and sustained for said processing, said plasma processing chamber having no separate plasma generation chamber, said plasma processing chamber having an upper end and a lower end;

a coupling window disposed at an upper end of said plasma processing chamber.

an RF antenna arrangement disposed above a plane defined by said substrate when said substrate is disposed within said plasma processing chamber for said processing;

an electromagnet arrangement disposed above said plane defined by said substrate, said electromagnet arrangement being configured so as to result in a radial variation in the static magnetic field topology within said plasma processing chamber in the region proximate said RF antenna when at least one direct current is supplied to said electromagnet arrangement, said radial variation being effective to affect processing uniformity across said substrate;

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a dc power supply coupled to said electromagnet arrang ment, said dc power supply having a controller to vary a magnitude of said at least one direct current, thereby changing said radial variation in said magnetic field topology within said plasma processing chamber in said region proximate said antenna to improve said processing uniformity across said substrate; and

a gas flow system coupled to said plasma processing chamber, said gas flow system controlling flow of input gas into at least two different regions of said plasma processing chamber, said input gas being a source gas suitable for use to etch said substrate in said plasma processing chamber;

wherein said at least two different regions include at least one peripheral region located at region located on the surface surrounding the periphery of said substantially cylindrical plasma processing chamber and at least one top region located at a top surface of [the] said substantially cylindrical plasma processing chamber; and

wherein said peripheral region of said plasma processing chamber does not include any points of said top region of said plasma processing chamber.

37. (Thrice Amended) A plasma processing system for processing a substrate, comprising:

a substantially cylindrical plasma processing chamber within which a plasma is both ignited and sustained for said processing, said plasma processing chamber having no separate plasma generation chamber, said plasma processing chamber having an upper end and a lower end;

a coupling window disposed at an upper end of said plasma processing chamber.

an RF antenna arrangement disposed above a plane defined by said substrate when said substrate is disposed within said plasma processing chamber for said processing;

an electromagnet arrangement disposed above said plane defined by said substrate, said electromagnet arrangement being configured so as to result in a radial variation in the static magnetic field topology within said plasma processing chamber in the region proximate said RF antenna when at least one direct current is supplied to said electromagnet arrangement, said radial variation being effective to affect processing uniformity across said substrate;

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a dc power supply coupled to said electromagnet arrangement, said dc power supply having a controller to vary a magnitude of said at least one direct current, thereby changing said radial variation in said magnetic field topology within said plasma processing chamber in said region proximate said antenna to improve said processing uniformity across said substrate; and

a gas flow system coupled to said plasma processing chamber, wherein said gas flow system controls release of input gas, suitable for etching the substrate, into a first and a second region within said plasma processing chamber, said first region being a top central region located at the top surface of [within] said substantially cylindrical plasma processing chamber and said second region being a peripheral region located on a surface surrounding the periphery of said substantially cylindrical [of] said plasma processing chamber; and

wherein said first and second regions do not have any points in common.

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1. (Amended four times) A plasma processing syst m, said plasma processing system comprising:

a substantially cylindrical plasma processing chamber used to process a substrate, said substantially cylindrical plasma processing chamber including a top region located on the top surface of said substantially cylindrical plasma processing chamber and a peripheral region located on a surface surrounding the periphery of said substantially cylindrical plasma processing;

a gas flow system coupled to said plasma processing chamber, said gas flow system controlling flow of input gas into at least two different regions of said plasma processing chamber; said input gas being a source gas suitable for use to etch said substrate in said plasma processing chamber;

wherein said at least two different regions include at least one peripheral region and at least one top region of said plasma processing chamber; and

wherein said peripheral region of said plasma processing chamber does not include any points of said top region of said plasma processing chamber.

2. A plasma processing system as recited in claim 1, wherein the at least two different regions include a top central region and an upper peripheral region.

3. A plasma processing system as recited in claim 1, wherein the at least two different regions include a top central region and a lower peripheral region.

4. A plasma processing system as recited in claim 1, wherein the at least two different regions include a top central region, a lower peripheral region, and an upper peripheral region.

5. A plasma processing system as recited in claim 1, wherein the at least two different regions include a lower region near the substrate.

6. A plasma processing system as recited in claim 1, wherein the plasma processing system includes a chuck and the least two different regions include a lower region near edges of the substrate, and

wherein the input gas is released through the chuck.

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7. A plasma processing system as recited in claim 1, wherein said flow system controls amount or volume of th input gas into the at least two different regions of said plasma processing chamber.

8. A plasma processing system as recited in claim 1, wherein said flow system controls flow rate of the input gas into the at least two different regions of said plasma processing chamber.

9. A plasma processing system as recited in claim 1, wherein the input gas includes at least first and second gases, and

wherein said flow system independently controls relative flow rate of the at least first and second gases into the at least two different regions of said plasma processing chamber.

10. A plasma processing system as recited in claim 1,

wherein said plasma processing system further comprises a gas delivery ring that is coupled to said plasma processing chamber, and

wherein said flow system controls amount or volume of the input gas to said gas delivery ring, thereby supplying the input gas to a peripheral region of said plasma processing chamber.

11. A plasma processing system as recited in claim 10, wherein said gas delivery ring is provided on an upper portion of the plasma processing chamber, thereby the gas delivery ring supplying the input gas to an upper peripheral region of said plasma processing chamber.

12. A plasma processing system as recited in claim 1, wherein said plasma processing chamber includes at least an inner wall, and the gas flow system comprises:

at least one gas inlet for receiving the input gas that is to be delivered into said plasma processing chamber;

at least first and second gas outlets that are each capable of delivering the input gas to the plasma processing system; and

wherein at least a portion of the input gas is delivered to the plasma processing chamber via said first and second gas outl ts.

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13. A plasma processing system as recited in claim 12, wherein the at least a portion of the input gas is released into a second region, the first region being a top central region within the plasma processing chamber, and the input gas that is released into the first region is delivered by the first gas outlet.

14. A plasma processing system as recited in claim 12, wherein the at least a portion of the input gas is released into a second region, the first region being an upper peripheral region that surrounds the inner wall of the plasma processing chamber, and the input gas that is released into the second region is delivered by the second gas outlet.

15. A plasma processing system as recited in claim 12, wherein the at least a portion of the input gas is released into a second region, the second region being a lower peripheral region that surrounds the inner wall of the plasma processing chamber, and the input gas that is released into the second region is delivered by the second gas outlet.

16. A plasma processing system as recited in claim 12, wherein the gas flow system receives a gas flow control signal for determining the amount or volume of the input gas that is delivered into the plasma processing chamber by each one of the first and second gas outlets.

17. A plasma processing system as recited in claim 16, wherein the gas flow control signal determines the flow rate of delivery of gas by each of the first and second gas outlets into the plasma processing chamber.

18. A plasma processing system as recited in claim 16, wherein the input gas includes at least first and second gases, and

wherein said flow control signal independently determines relative flow rate of the at least first and second gases into the at least two different regions of said plasma processing chamber.

19. (Thrice Amended) A plasma processing system for processing a substrate, comprising:

a substantially cylindrical plasma processing chamber within which a plasma is both ignited and sustained for said processing, said plasma processing chamber having

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no separate plasma generation chamber, said plasma processing chamber having an upper end and a lower end;

a coupling window disposed at an upper end of said plasma processing chamber.

an RF antenna arrangement disposed above a plane defined by said substrate when said substrate is disposed within said plasma processing chamber for said processing;

an electromagnet arrangement disposed above said plane defined by said substrate, said electromagnet arrangement being configured so as to result in a radial variation in the static magnetic field topology within said plasma processing chamber in the region proximate said RF antenna when at least one direct current is supplied to said electromagnet arrangement, said radial variation being effective to affect processing uniformity across said substrate;

a dc power supply coupled to said electromagnet arrangement, said dc power supply having a controller to vary a magnitude of said at least one direct current, thereby changing said radial variation in said magnetic field topology within said plasma processing chamber in said region proximate said antenna to improve said processing uniformity across said substrate; and

a gas flow system coupled to said plasma processing chamber, said gas flow system controlling flow of input gas into at least two different regions of said plasma processing chamber, said input gas being a source gas suitable for use to etch said substrate in said plasma processing chamber;

wherein said at least two different regions include at least one peripheral region located at region located on the surface surrounding the periphery of said substantially cylindrical plasma processing chamber and at least one top region located at a top surface of said substantially cylindrical plasma processing chamber; and

wherein said peripheral region of said plasma processing chamber does not include any points of said top region of said plasma processing chamber.

20. A plasma processing system as recited in claim 19, wherein the at least two different regions include a top central region and an upper peripheral region.

21. A plasma processing system as recited in claim 19, wherein the at least two different regions include a top central region and a lower peripheral region.

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22. A plasma processing system as recited in claim 19, wherein the at least two different regions include a top central region, a lower peripheral region, and an upper peripheral region.

23. A plasma processing system as recited in claim 19, wherein said flow system controls amount or volume of the input gas into the at least two different regions of said plasma processing chamber.

24. A plasma processing system as recited in claim 19, wherein said flow system controls flow rate of the input gas into the at least two different regions of said plasma processing chamber.

25. A plasma processing system as recited in claim 19, wherein the input gas includes at least first and second gases, and

wherein said flow system independently controls relative flow rate of the at least first and second gases into the at least two different regions of said plasma processing chamber.

26. A plasma processing system as recited in claim 19, wherein said plasma processing system further comprises a gas delivery ring that is coupled to said plasma processing chamber, and

wherein said flow system controls amount or volume of the input gas to said gas delivery ring, thereby supplying the input gas to a peripheral region of said plasma processing chamber.

27. A plasma processing system as recited in claim 26, wherein said gas delivery ring is provided on an upper portion of the plasma processing chamber, thereby the gas delivery ring supplying the input gas to an upper peripheral region of said plasma processing chamber.

28. A plasma processing system as recited in claim 19, wherein said plasma processing chamber includes at least an inner wall, and the gas flow system comprises:

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at least one gas inl t for receiving the input gas that is to be flown into said plasma processing chamb r;

at least first and second gas outlets that are each capable of delivering the input gas to the plasma processing system; and

wherein at least a portion of the input gas is delivered to the plasma processing chamber via said first and second gas outlets.

29. A plasma processing system as recited in claim 28, wherein the at least a portion of the input gas is released into a second region, the first region being a top central region within the plasma processing chamber, and the input gas that is released into the first region is delivered by the first gas outlet.

30. A plasma processing system as recited in claim 28, wherein the at least a portion of the input gas is released into a second region, the first region being an upper peripheral region that surrounds the inner wall of the plasma processing chamber, and the input gas that is released into the second region is delivered by the second gas outlet.

31. A plasma processing system as recited in claim 28, wherein the at least a portion of the input gas is released into a second region, the second region being a lower peripheral region that surrounds the inner wall of the plasma processing chamber, and the input gas that is released into the second region is delivered by the second gas outlet.

32. A plasma processing system as recited in claim 28, wherein the gas flow system receives a gas flow control signal for determining the amount or volume of the input gas that is delivered into the plasma processing chamber by each one of the first and second gas outlets.

33. A plasma processing system as recited in claim 32, wherein the gas flow control signal determines the flow rate of delivery of gas by each of the first and second gas outlets into the plasma processing chamber.

34. A plasma processing system as recited in claim 32, wherein the input gas includes at least first and second gases, and

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wherein said flow control signal independently determines relative flow rate of the at least first and second gases into th at least two different regions of said plasma processing chamber.

35. A plasma processing system as recited in claim 19, wherein the at least two different regions include a lower region near the substrate.

36. A plasma processing system as recited in claim 19, wherein the plasma processing system includes a chuck and the least two different regions include a lower region near edges of the substrate, and

wherein the input gas is released through the chuck.

37. (Thrice Amended) A plasma processing system for processing a substrate, comprising:

a substantially cylindrical plasma processing chamber within which a plasma is both ignited and sustained for said processing, said plasma processing chamber having no separate plasma generation chamber, said plasma processing chamber having an upper end and a lower end;

a coupling window disposed at an upper end of said plasma processing chamber.

an RF antenna arrangement disposed above a plane defined by said substrate when said substrate is disposed within said plasma processing chamber for said processing;

an electromagnet arrangement disposed above said plane defined by said substrate, said electromagnet arrangement being configured so as to result in a radial variation in the static magnetic field topology within said plasma processing chamber in the region proximate said RF antenna when at least one direct current is supplied to said electromagnet arrangement, said radial variation being effective to affect processing uniformity across said substrate;

a dc power supply coupled to said electromagnet arrangement, said dc power supply having a controller to vary a magnitude of said at least one direct current, thereby changing said radial variation in said magnetic field topology within said plasma processing chamber in said region proximate said antenna to improve said processing uniformity across said substrate; and

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a gas flow system coupled to said plasma processing chamber, wherein said gas flow system controls release of input gas, suitable for etching th substrate, into a first and a second region within said plasma processing chamber, said first region being a top central region located at the top surface of said substantially cylindrical plasma processing chamber and said second region being a peripheral region located on a surface surrounding the periphery of said substantially cylindrical said plasma processing chamber; and

wherein said first and second regions do not have any points in common.

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